

April 17, 1934.

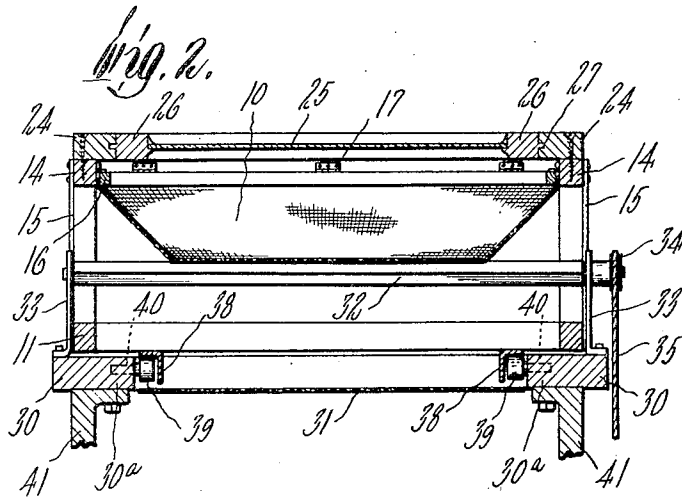
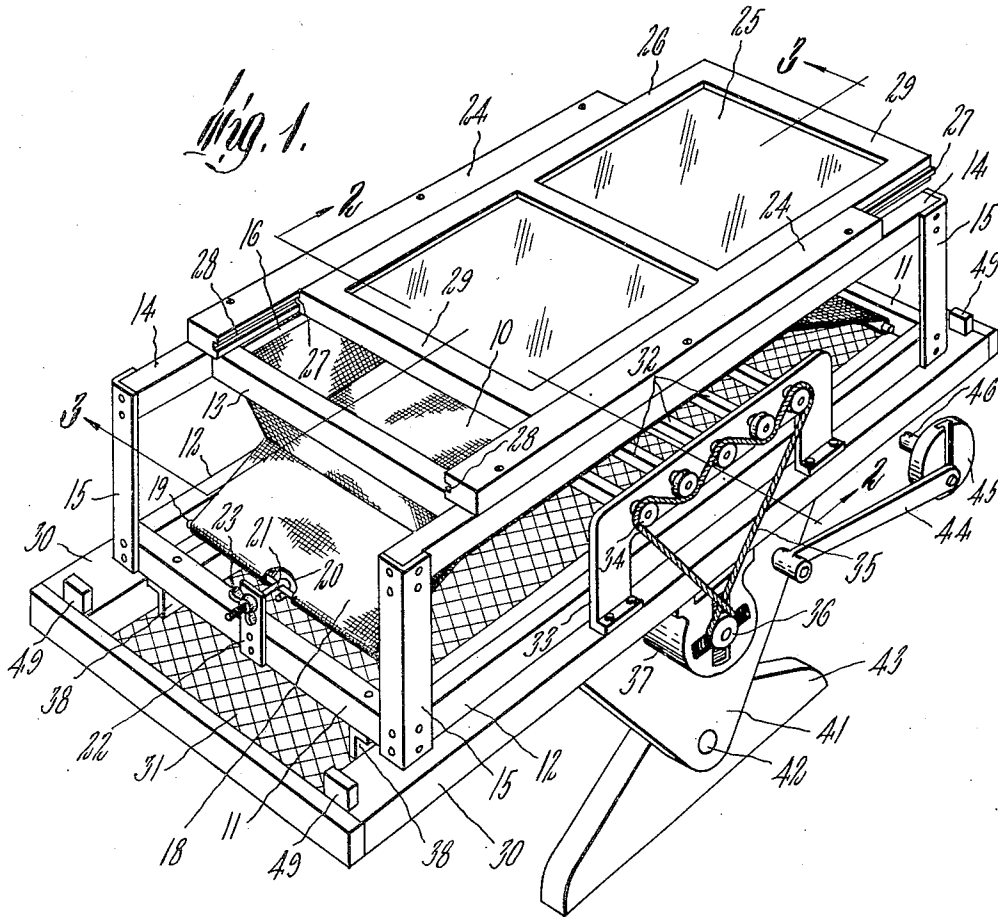
I. KRUGER

1,955,552

FLOCK APPLYING MACHINE

Filed Sept. 29, 1933

2 Sheets-Sheet 1



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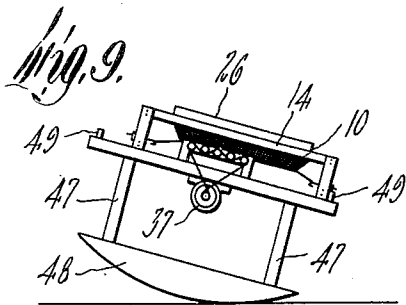
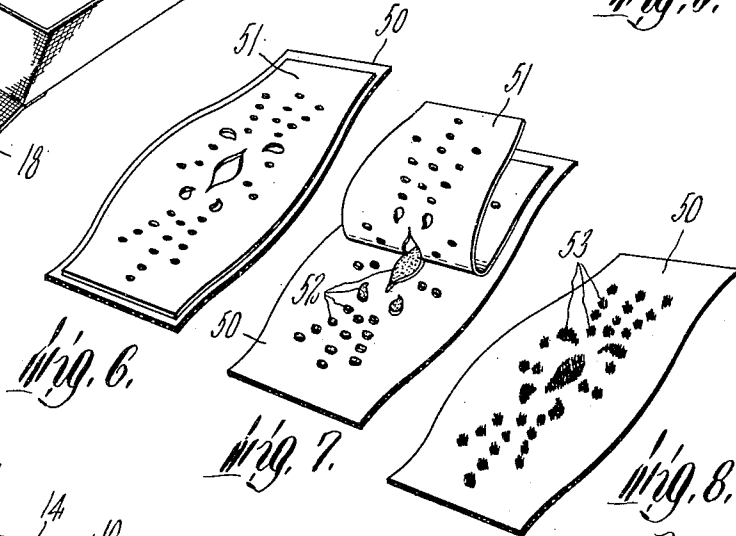
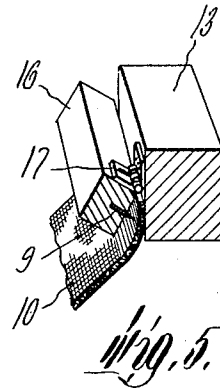
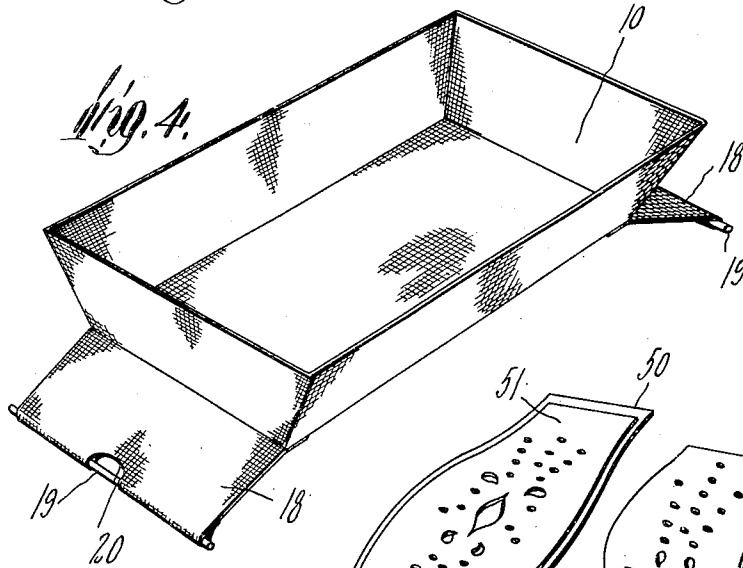
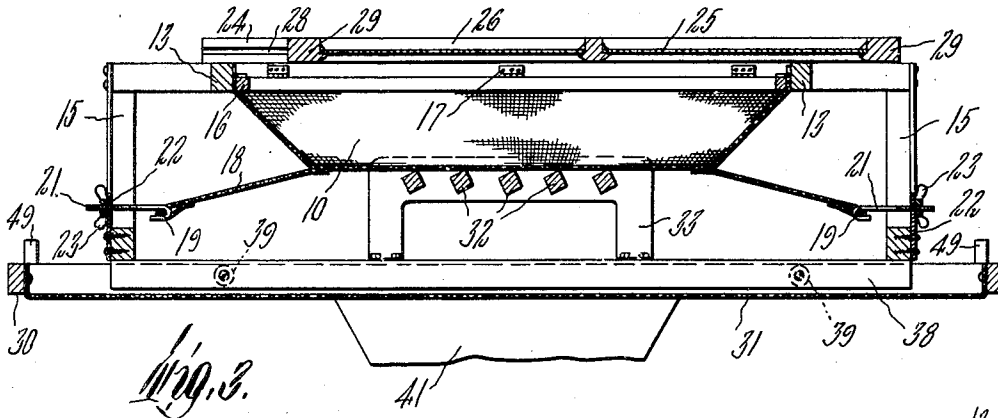
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1,955,552

FLOCK APPLYING MACHINE

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

1,955,552

FLOCK-APPLYING MACHINE

Isidor Kruger, Newton, Mass.

Application September 29, 1933, Serial No. 691,520

10 Claims. (Cl. 91—8)

The subject of this invention is a machine for applying fiber flock to fabric which has been treated with a suitable adhesive so that the flock will be made properly adherent thereto.

5 It is sometimes the practice to produce ornamental effects on flexible fabrics of the nature of cloth, leather, etc., by applying to the fabric a suitable adhesive in the desired predetermined pattern, as by means of a stencil, distributing
10 fiber flock over the fabric so as to anchor fibers to the fabric at the adhesive-treated areas, and shedding the loose fibers from the fabric. In order to realize uniformity of flock anchorage as well as sufficient upstanding fibers to give the
15 appearance of velvet or other pile fabric at the adhesive-treated areas, it is necessary to vibrate the fabric while distributing or showering flock thereover and shedding the loose fibers therefrom for a considerable period of time with the fabric
20 in a flat condition. An object of the present invention is to provide a machine for thus applying the flock to the adhesive-coated fabric so that the foregoing desired results may be had in a minimum period of time and with minimum
25 exertion by the operator. Other objects are to provide a machine of this character which can be switched with a minimum of delay from flock of one color to that of another; which permits the operator to view the work in progress; which
30 functions with practically no loss of flock or dustiness in the atmosphere; and which is of simple, compact, and inexpensive construction.

The machine of the present invention includes a flexible fabric receptacle having a flat bottom
35 to which the adhesive-coated fabric may be pinned or otherwise temporarily fastened in a flat condition and in which a supply of the fiber flock can be kept. It also includes a frame or carriage from which the receptacle is suspended
40 at its walls and which is equipped with means for keeping the bottom of the receptacle taut and thereby keeping the adhesive-coated fabric flat. Means are provided for continuously vibrating the bottom of the receptacle substantially uniformly
45 throughout and for redistributing or showering the flock over the fabric being treated. In order that no fiber flock be released and lost in the atmosphere, the frame or carriage for the
50 receptacle is provided with a closure for the top of the receptacle, preferably in the form of a window capable of being opened and closed and permitting the operator to view the work in progress.

55 With the foregoing and other features and objects in view, I shall now describe my invention in greater detail with reference to the accompanying drawings, wherein,—

60 Figure 1 shows in perspective a machine embodying the invention.

Figures 2 and 3 are sections on the lines 2—2 and 3—3 respectively of Figure 1.

Figure 4 is a perspective view of the receptacle alone.

Figure 5 is a detail view illustrating the means 65 for releasably suspending the receptacle from the frame.

Figures 6, 7 and 8 illustrate a piece of fabric at various stages of the process.

Figure 9 is a side view of a slightly modified 70 form of machine.

The receptacle 10 is, as shown in Figure 4, of generally rectangular form and may be made from any suitable flexible fabric such as canvas. The carriage or frame for the receptacle 75 may, as best shown in Figure 1, be essentially of cubical configuration and include frame members at the edges of such configuration, namely, lower end members 11, lower side members 12, upper end members 13, upper side members 14, 80 and vertical corner members 15, all interconnected as shown. The receptacle may be removably suspended from the frame as by engaging its wall margins in between clamping bars 16 lying next to the upper members 13 and 14, 85 suitable spring hinges 17 connecting the bars and the members so as to clamp the margins in position, as best shown in Figure 5. The bars 16 are preferably equipped with pins 9 for piercing the margins at intervals and holding them 90 in position. Projecting outwardly from both end corners of the receptacle are flaps 18 whose marginal portions are reinforced by rods 19 and have recesses 20 permitting the rods to be gripped and pulled so as to tension the bottom of the 95 receptacle. The tensioning means illustrated consists of a bolt 21 having a hook portion engaging the rod 19 at the recess 20 and passing loosely through a bracket 22 projecting upwardly from the frame member 11, a wing nut 23 engaging 100 the threaded portion of the bolt and bearing against the bracket. By tightening the nut 23, the desired tautness of the bottom of the receptacle may be had. Inasmuch as the margins of the flaps 18 project somewhat beyond the upper 105 or wall margins of the receptacle, it becomes necessary to locate the frame members 13 somewhat inwardly of the ends of the frame members 14, although, for purposes of convenience, the frame as a whole has been considered as being 110 of cubical configuration. It is thus seen that the receptacle can be readily assembled with and removed from the frame. This is a distinct advantage in changing from flock of one color to that of another, as it is much easier to change 115 receptacles than to remove the flock cleanly or completely from the receptacle and replace it by flock of another color.

The frame members 14 may have affixed there- 120 over or formed integral therewith a pair of lon-

itudinal bars 24 for holding and guiding a longitudinally movable window which includes window-panes 25 of celluloid, glass or other transparent material, and a sash 26 whose side members 27 are provided at their outer edges with tongues 27 fitting into longitudinal grooves 28 formed in the inner sides of the bars 24. The end members 29 of the sash preferably fit nicely against the frame members 13 so as to avoid leakage of flock therebetween. The window not only constitutes a closure for the top of the receptacle, but permits the operator to view the work as it is going on in the receptacle and to determine when the work is complete and, accordingly, when the operation of the machine should be stopped.

The frame and receptacle are mounted on a suitable platform which as shown consists of an open rectangular frame 30 whose opening is covered with chicken-wire or other coarsely foraminous material 31. The purpose of the foraminous material is to support the receptacle as it is being removed from the frame and thus to avoid the spillage or loss of flock therefrom. The use of a foraminous covering material also avoids the accumulation of flock or other material on the platform. The vibration of the bottom of the receptacle may be effected by a series of bars 32 which extend in spaced parallel relationship transversely across the bottom of the receptacle. These bars, which may be of rectangular or other non-circular form, engage and slightly raise the bottom of the receptacle as their corners meet the bottom, wherefore, upon being rapidly rotated, the bars cause the bottom of the receptacle to undergo a rapid vibratory action. The end portions of the bars may be journaled for rotation in suitable brackets 33 upstanding from the frame 30. The rotation of the bars may be effected as by pulleys 34 at their end portions, all of which may derive their motion from a belt 35 engaging thereover and driven directly from a pulley 36 on an electric motor 37. The motor may, if desired, be built into the frame 30, as shown.

Inasmuch as the vibration of the bottom of the receptacle tends to shed the flock from the work and to pile it up locally, whereas it is necessary to shower the work repeatedly with flock, it is desirable to reciprocate the frame and receptacle so as to cause a redistribution or showering of the flock over the bottom of the receptacle and the work maintained thereon while the bottom of the receptacle is being vibrated. In this connection, it is well to observe that although sufficient fiber flock is maintained in the receptacle to ensure an excess over that needed to treat the work, nevertheless the bottom of the receptacle is not constantly covered throughout by a layer of flock of substantial depth. If this latter condition were maintained, it would be impossible to produce the desired upstanding fiber arrangement in the adhesive-coated areas of the work. In other words, it is only by providing loose fiber flock on the work, removing or shedding those fibers that remain loose by vibratory action, and repeating these steps that the desired effect is produced on the goods. The reciprocation of the frame and receptacle so as to ensure a redistribution or showering of the flock on the work may be had by mounting the frame reciprocatably on the platform 30 so as to permit the frame to be reciprocated either mechanically or manually. As shown in Figure 1, there is a pair of tracks 38 extending longitudinally and in parallelism between the two frame

members 11. These tracks, which may take the form of angle irons, are shown bearing on rollers 39 journaled for rotation on pins 40 projecting from the side members 30a of the platform. The platform may have projecting therefrom a pair of legs 41 whose lower end portions are pivotally secured by pins 42 to blocks 43. It is thus seen that the platform, which may assume a normal horizontal position, is rockable to effect an inclined to-and-fro ride of the frame and receptacle supported thereby. This inclined to-and-fro ride not only ensures a redistribution or showering of the flock over the bottom of the receptacle and the work maintained thereon, but leads to a substantially uniform vibratory action over the entire bottom of the receptacle as the bottom traverses the rotating bars 32. The rocking movement of the platform may be effected mechanically as by a crank 44, one end of which is pivotally secured to a leg 41 and the other end of which is pivotally secured to an eccentric 45 mounted on a shaft 46 which can be driven by suitable means, not shown. Suitable stops 49 are provided on the platform to limit the inclined to-and-fro ride of the frame and receptacle. The sudden stopping of the frame and receptacle at the end of each to-and-fro movement tends to jar or shake any stagnant flock so that it will flow or shower over the work.

Rather than providing a pivotal mounting for the platform, the platform may, as shown in Figure 9, be equipped on each side with a pair of legs 47 terminating as a rocker 48 resting on the floor. In such case, the operator must do the rocking necessary to effect the desired inclined to-and-fro ride of the frame and receptacle between the stops 49 on the platform 30, which may, as shown in Figure 9, assume a normally inclined position.

A machine of the foregoing construction and mode of operation is especially adaptable for applying flock to the parts of a dress before they are stitched together or to flat parts of any other garment or fabric article. Assuming that the sleeve of a woman's dress, for example, is to undergo the action of the machine of the present invention, the process is carried out somewhat as follows. First, the precut fabric sleeve 50, as shown in Figure 6, is laid down flat and a stencil 51 having the cut-out pattern which the applied flock is to assume is placed thereover. A suitable adhesive, such as nitrocellulose cement, is then spread over the stencil, thereby depositing the adhesive in the desired pattern on the sleeve. In Figure 7, the sleeve is shown coated with the adhesive 52 in the desired pattern, with the stencil partly lifted away. The sleeve is next placed in the receptacle 10 so that it lies flatly on the bottom of the receptacle and is fixed in place by pins or other suitable fasteners. Thereupon, flock of the desired color is put in the receptacle and the machine is operated, as already described, until the areas coated with the adhesive have been uniformly covered with upstanding fibers 53, as shown in Figure 8. The operation of the machine may then be stopped and the ornamented sleeve removed therefrom and, if desired, placed in a warm atmosphere to ensure full setting of the adhesive.

I claim:

1. A machine of the class described comprising a receptacle having a flexible fabric bottom, means for maintaining the bottom of said receptacle flat and taut, means for continuously vibrating the bottom and means for reciprocating said receptacle.

2. A machine of the class described comprising a receptacle having a flexible fabric bottom, means

for maintaining the bottom of said receptacle flat and taut, means for continuously vibrating the bottom and means for causing said receptacle to move to-and-fro at an angle of inclination and to be stopped suddenly at the end of each to-and-fro movement.

3. A machine of the class described comprising a receptacle having a flexible fabric bottom and equipped with a transparent top capable of being opened and closed, means for maintaining the bottom of said receptacle flat and taut, means for continuously vibrating the bottom and means for causing said receptacle to move to-and-fro at an angle of inclination and to be stopped suddenly at the end of each to-and-fro movement.

4. A machine of the class described comprising a flexible fabric receptacle having a flat bottom, a carriage from which said receptacle is suspended at its walls, said carriage being reciprocatably mounted and including means for maintaining the bottom of said receptacle taut, a plurality of non-circular rotatable bars engaging the bottom of said receptacle at spaced intervals and adapted upon rotation to vibrate said bottom, and means for causing the rotation of said bars.

5. A machine of the class described comprising a flexible fabric receptacle having a flat bottom, a carriage from which said receptacle is suspended at its walls, said carriage being reciprocatably mounted and including means for maintaining the bottom of said receptacle taut, a plurality of non-circular rotatable bars engaging the bottom of said receptacle at spaced intervals and adapted upon rotation to vibrate said bottom, means for causing the rotation of said bars, and means for causing the reciprocation of said carriage.

6. A machine of the class described comprising a flexible fabric receptacle having a flat bottom, a carriage from which said receptacle is suspended at its walls, said carriage being reciprocatably mounted and including means for maintaining the bottom of said receptacle taut, and a window top for said receptacle capable of being opened and closed, a plurality of non-circular rotatable bars engaging the bottom of said receptacle at spaced intervals and adapted upon rotation to vibrate said bottom, means for causing the rotation of said bars, and means for causing the reciprocation of said carriage.

7. Apparatus of the class described comprising a generally rectangular flexible fabric receptacle having a flat bottom and a pair of flaps projecting outwardly from its bottom end corners, a frame from which said receptacle is suspended at its walls, said frame being essentially of cubical configuration and including interconnected frame members at the edges of such configuration, means on the upper frame members for releasably engaging the walls of said receptacle, means on the lower frame members for releasably engaging and tensioning said flaps and thereby holding the bottom of said receptacle taut, a plurality of non-circular rotatable bars extending transversely across and engaging the bottom of said receptacle at spaced intervals and adapted upon rotation to vibrate said bottom, and means for causing the rotation of said bars.

8. Apparatus of the class described comprising a generally rectangular flexible fabric receptacle having a flat bottom and a pair of flaps projecting outwardly from its bottom end corners, a frame from which said receptacle is suspended at its walls, said frame being essentially of cubical configuration and including interconnected frame members at the edges of such configuration,

means on the upper frame members for releasably engaging the walls of said receptacle, means on the lower frame members for releasably engaging and tensioning said flaps and thereby holding the bottom of said receptacle taut, a window top for said receptacle adapted to be moved longitudinally of said receptacle to open and closed positions supported and guided in its longitudinal movements by the upper side frame members, a plurality of non-circular rotatable bars extending transversely across and engaging the bottom of said receptacle at spaced intervals and adapted upon rotation to vibrate said bottom, and means for causing the rotation of said bars.

9. Apparatus of the class described comprising a generally rectangular flexible fabric receptacle having a flat bottom and a pair of flaps projecting outwardly from its bottom end corners, a frame from which said receptacle is suspended at its walls, said frame being essentially of cubical configuration and including interconnected frame members at the edges of such configuration, means on the upper frame members for releasably engaging the walls of said receptacle, means on the lower frame members for releasably engaging and tensioning said flaps and thereby holding the bottom of said receptacle taut, a window top for said receptacle adapted to be moved longitudinally of said receptacle to open and closed positions supported and guided in its longitudinal movements by the upper side frame members, a plurality of non-circular rotatable bars extending transversely across and engaging the bottom of said receptacle at spaced intervals and adapted upon rotation to vibrate said bottom, means for causing the rotation of said bars, and a platform on which said frame is free to ride to-and-fro, said platform including stops for limiting the to-and-fro movement of said frame.

10. Apparatus of the class described comprising a generally rectangular flexible fabric receptacle having a flat bottom and a pair of flaps projecting outwardly from its bottom end corners, a frame from which said receptacle is suspended at its walls, said frame being essentially of cubical configuration and including interconnected frame members at the edges of such configuration, means on the upper frame members for releasably engaging the walls of said receptacle, means on the lower frame members for releasably engaging and tensioning said flaps and thereby holding the bottom of said receptacle taut, a window top for said receptacle adapted to be moved longitudinally of said receptacle to open and closed positions supported and guided in its longitudinal movements by the upper side frame members, a plurality of non-circular rotatable bars extending transversely across and engaging the bottom of said receptacle at spaced intervals and adapted upon rotation to vibrate said bottom, means for causing the rotation of said bars, a pair of tracks extending from one lower end frame member to the other, a substantially horizontal platform equipped with rollers on which the tracks of said frame are mounted so as to permit said frame to ride thereon, means rockably supporting said platform, and means for rocking said platform so as to cause the frame and receptacle to ride at an incline to-and-fro thereon, said platform including stops to limit the ride of said frame.

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